

WHAT IS CLAIMED IS:

1 1. A method of authenticating a set of N information blocks, said method
2 comprising:

3 obtaining an initial hash value for a set of N information blocks,
4 wherein N is an integer;

5 altering one of said N information blocks from said set of N
6 information blocks so as to form a revised set of N information blocks;

7 calculating a revised hash value for said revised set of N information
8 blocks; while

9 calculating a check hash value for said N information blocks; then

10 comparing said check hash value with said initial hash value;

11 accepting said revised hash value for said revised set of N information
12 blocks if said check hash value matches said initial hash value.

1 2. The method as described in claim 1 wherein said calculating said
2 revised hash value while calculating said check hash value comprises:

3 calculating said revised hash value in parallel with said check hash
4 value.

1 3. The method as described in claim 1 wherein said calculating said
2 revised hash value while calculating said check hash value comprises:

3 hashing said altered block of data so as to obtain a first hashing result;

4 storing said first hashing result in a processor; and then

5 hashing the corresponding unaltered block of data so as to obtain a
6 second hashing result.

1 4. The method as described in claim 1 wherein said calculating said
2 revised hash value while calculating said check hash value comprises:

3 concurrently hashing said altered block of data so as to obtain a first
4 hashing result and hashing the corresponding unaltered block of data so as to obtain a second
5 hashing result.

1 5. The method as described in claim 1 wherein said calculating said
2 revised hash value while calculating said check hash value comprises:

3 utilizing a single processor to calculate said revised hash value and to
4 calculate said check hash value.

1 6. The method as described in claim 1 and further comprising:
2 performing a linear hash of said set of data by hashing said N blocks of
3 data in sequential order from block 1 to block N.

1 7. The method as described in claim 1 wherein said obtaining said initial
2 hash value for said set of N information blocks comprises:

3 hashing each of said N information blocks in said set of N information
4 blocks.

1 8. The method as described in claim 1 and further comprising:
2 storing said initial hash value in a processor.

1 9. The method as described in claim 1 wherein said altering one of said N
2 information blocks comprises:

3 storing a new value for at least part of one of said N information
4 groups.

1 10. The method as described in claim 1 wherein said comparing said check
2 hash value with said initial hash value comprises:

3 determining whether said check hash value and said initial hash value
4 are exactly the same.

1 11. The method as described in claim 1 wherein said accepting said
2 revised hash value comprises:

- 3 replacing said initial hash value with said revised hash value.
- 1 12. The method as described in claim 1 and further comprising:
- 2 storing the new revised hash value in the memory area previously
- 3 occupied by the initial hash value.
- 1 13. The method as described in claim 1 and further comprising:
- 2 not accepting said revised hash value as a replacement for said initial
- 3 hash value if said check hash value does not match said initial hash value.
- 1 14. The method as described in claim 13 and further comprising:
- 2 indicating a failure to authenticate.
- 1 15. The method as described in claim 1 and further comprising:
- 2 utilizing said set of data for digital rights management.
- 1 16. The method as described in claim 1 and further comprising:
- 2 replacing said initial hash value with said revised hash value.
- 1 17. The method as described in claim 1 and further comprising:
- 2 receiving as part of an initialization routine a length of a data set to be
- 3 hashed, wherein said data set is comprised of said N information groups.
- 1 18. The method as described in claim 17 and further comprising:
- 2 padding at least one of said N information groups so that each of said
- 3 N information groups is of equal length.
- 1 19. The method as described in claim 1 and further comprising:
- 2 initializing a processor so as to perform a hashing routine.
- 1 20. The method as described in claim 1 and further comprising:
- 2 initializing a hashing routine by entering the length of said set of data.

- 1 21. The method as described in claim 1 and further comprising:
2 dividing the set of data into a plurality of blocks.
- 1 22. The method as described in claim 1 and further comprising:
2 dividing the set of data into a plurality of blocks of data;
3 padding the last block of data so that each of said blocks of data is of
4 equal length.
- 1 23. A method of authenticating a set of N information blocks, said method
2 comprising:
3 obtaining an initial root key for a set of data comprised of a plurality of
4 blocks of data, said root key operable for authenticating said set of data;
5 calculating hash keys for said plurality of blocks of data so that each of
6 said hash keys corresponds to only one of said blocks of data and so that each of said blocks
7 of data corresponds to only one of said hash keys;
8 storing said hash keys for said plurality of blocks of data;
9 altering one of said blocks of data so as to form a revised block of data;
10 calculating a second hash key for said revised block of data, wherein
11 said revised block of data immediately prior to being revised corresponds to a first hash key
12 and wherein said first hash key is one of said hash keys for said plurality of blocks of data;
13 utilizing said stored hash keys, including said first hash key, to
14 calculate a check root key while utilizing said stored hash keys and said second hash key
15 substituted in place of said first hash key to calculate a new root key;
16 comparing said check root key with said initial root key;
17 accepting said new root key if said check root key matches said initial
18 root key.

1 24. The method as described in claim 23 wherein said utilizing said stored
2 hash keys, including said first hash key, to calculate said check root key is done in parallel
3 with said utilizing said stored hash keys and said second hash key substituted in place of said
4 first hash key to calculate said new root key.

1 25. The method as described in claim 24 and further comprising:
2 computing a branch key;
3 hashing said branch key and said first hash key; and
4 hashing said branch key and said second hash key.

1 26. The method as described in claim 24 and further comprising:
2 computing a branch key;
3 hashing said branch key and said first hash key; while
4 hashing said branch key and said second hash key.

1 27. The method as described in claim 24 and further comprising:
2 computing a branch key; and concurrently
3 computing a result from said branch key and said first hash key; while
4 computing a result from said branch key and said second hash key.

1 28. The method as described in claim 24 and further comprising:
2 utilizing a single processor to calculate said check root key and said
3 new root key.

1 29. The method as described in claim 23 and further comprising:
2 dividing an initial set of data into X blocks, where X is equal to 2
3 raised to the Y power and where Y is an integer.

1 30. The method as described in claim 23 and further comprising:

2 calculating intermediate branch keys by hashing previously determined
3 branch keys; and then

4 utilizing said intermediate branch keys to calculate said new root key.

1 31. The method as described in claim 23 and further comprising:
2 encrypting said hash keys for said plurality of blocks; and
3 storing said encrypted hash keys in memory outside of a processor.

1 32. The method as described in claim 23 and further comprising:
2 storing said hash keys for said plurality of blocks in a processor.

1 33. The method as described in claim 23 and further comprising:
2 storing said root key inside a processor.

1 34. The method as described in claim 23 wherein said altering one of said
2 blocks of data comprises:

3 storing a new value for at least part of one of said information groups

1 35. The method as described in claim 23 wherein said comparing said
2 check root key with said initial root key comprises:

3 determining whether said check root key and said initial root key are
4 exactly the same.

1 36. The method as described in claim 23 wherein said accepting said new
2 root key comprises replacing said initial root key with said new root key.

1 37. The method as described in claim 36 and further comprising:
2 storing said new root key in a processor in a memory area previously
3 occupied by said initial root key.

1 38. The method as described in claim 23 wherein said set of N information
2 blocks is at least partially utilized for managing digital rights.

1 39. The method as described in claim 23 wherein said set of N information
2 blocks is at least partially utilized as an entitlement control message for receiving a program.

1 40. The method as described in claim 23 and further comprising:
2 initializing a hashing function by receiving the length of said N
3 information blocks.

1 41. The method as described in claim 40 and further comprising:
2 padding the final block of the N information blocks prior to hashing
3 the Nth block.

1 42. The method as described in claim 23 and further comprising:
2 initializing a hashing function.

1 43. The method as described in claim 23 and further comprising:
2 obtaining a set of data; and
3 dividing said set of data into a plurality of blocks.